

## TECHNOLOGY READINESS LEVEL: 7

**US PATENT # 7,838,083**

DEMONSTRATION OF AN ACTUAL DEVELOPMENT VERSION OF THE METHOD AND APPARATUS HAS BEEN DONE IN THE OPERATIONAL ENVIRONMENT

## TECHNOLOGY SUMMARY

Ceramic thermal barrier coatings (TBCs) have been used since the 1970's to protect gas turbine blades from oxidation and corrosion. A lower thermal conductivity is desirable in order to increase component lifetimes by allowing a thinner, lighter ceramic coating to be used. Sandia's method and apparatus for depositing thermal barrier coatings reduces the total processing time which greatly reduces costs by increasing throughput rates. Up to 12 hours of processing time could be saved by using this improved method. Sandia's method also increases the thermal resistance of the blades, allowing for higher operating temperatures which leads to higher efficiency. This technology is only available to companies who can combine Ion Beam Assisted Deposition (IBAD) with Electron Beam Physical Vapor Deposition (EBPVD).



### POTENTIAL APPLICATIONS

- Jet turbine engines
- Power generation
- Marine propulsion
- Advanced fusion plants
- Gas turbine engines
- Industrial regeneration

### TECHNOLOGICAL BENEFITS

- Increased thermal resistance of turbine blades
- Lower thermal conductivity
- Reduces cost
- High turbine efficiency
- Increases component lifetime

### TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

**[ip@sandia.gov](mailto:ip@sandia.gov)**

*Refer to SD # 7585*

or visit

**<https://ip.sandia.gov>**